

Mr. Larry McKinley  
Dupont Photomasks, Inc.  
1901 East Morgan Street  
Kokomo, Indiana 46904

Re: Registered Construction and Operation Status,  
**067-14962-00066**

Dear Mr. McKinley:

The application from Dupont Photomasks, Inc., received on October 22, 2001, has been reviewed. Based on the data submitted and the provisions in 326 IAC 2-5.5, it has been determined that the following equipment used in the manufacture of photomasks (templates for electronic circuit boards), located at 1901 East Morgan Street, Kokomo, Indiana 46904 are classified as Registered:

- (a) One (1) proposed diesel-fueled emergency generator, rated at 300 kilowatts (kW) (400 horsepower (HP));
- (b) One (1) proposed CORE Process B, which will utilize non-VOC/HAP material;
- (c) One (1) existing natural gas-fired boiler, with a heat input capacity of 4.5 million British thermal units per hour (mmBtu/hr);
- (d) One (1) existing natural gas-fired boiler, with a heat input capacity of 3.5 mmBtu/hr;
- (e) Four (4) existing natural gas-fired space heaters each with a heat input capacity of 0.102 mmBtu/hr;
- (f) One (1) existing Standard Photomasks Process Line A, which consists of the following:
  - (1) Two (2) Ebeam Write processes, where microfine etches are printed on the photomasks, with a total maximum rated capacity of 7.3 masks per hour;
  - (2) Two (2) Develop/Rinse Tanks, each has a capacity of 2 cubic feet (ft<sup>3</sup>). The two (2) tanks have a total maximum usage of 1.19 pound of solvent per hour (mixture of Methyl Isoamyl Ketone and hexanone, used as developer and rinse);
  - (3) Two (2) Process Etch Tanks, which are capable of using a maximum of 0.8 gallon of caustic soda and acids per hour each; and
  - (4) Three (3) Open Top Vapor Degreasers, identified as VD-1, VD-2 and VD-3, each is capable of using 2.43 gallon of isopropyl alcohol per day.

The following conditions shall be applicable:

1. Visible Emission Limitations [326 IAC 5-1-2]

Pursuant to 326 IAC 5-1-2 (Visible Emission Limitations) except as provided in 326 IAC 5-1-3 (Temporary Exemptions), the visible emissions shall meet the following:

- (a) visible emissions shall not exceed an average of 40% opacity in 24 consecutive readings.
- (b) visible emissions shall not exceed 60% opacity for more than a cumulative total of 15 minutes (60 readings) in a 6-hour period.

2. Particulate Matter Limitation [326 IAC 6-2-3(a)]

Pursuant to 326 IAC 6-2-3(a) (Particulate Emission Limitations for Sources of Indirect Heating), the particulate matter (PM) emissions from the 4.5 million BTU/hour (mmBtu/hr) boiler, V2 and the 3.5 mmBtu/hr boiler, V3 shall each be limited to 0.6 pound per million BTU heat input.

3. Open Top Vapor Degreaser [326 IAC 8-3-3]

Pursuant to 326 IAC 8-3-3, the owner or operator of the three (3) Open Top Vapor Degreasers, identified as VD-1, VD-2 and VD-3 shall:

- (a) equip the vapor degreaser with a cover that can be opened and closed easily without disturbing the vapor zone;
- (b) keep the cover closed at all times except when processing work loads through the degreaser;
- (c) minimize solvent carryout by:
  - (A) racking parts to allow complete drainage;
  - (B) moving parts in and out of the degreaser at less than 3.3 meters per minute (eleven (11) feet per minute);
  - (C) degreasing the workload in the vapor zone at least thirty (30) seconds or until condensation ceases;
  - (D) tipping out any pools of solvent on the cleaned parts before removal; and
  - (E) allowing parts to dry within the degreaser for at least fifteen (15) seconds or until visually dry;
- (d) not degrease porous or absorbent materials, such as cloth, leather, wood or rope;
- (e) not occupy more than half of the degreaser's open top area with the workload;
- (f) not load the degreaser such that the vapor level drops more than fifty percent (50%) of the vapor depth when the workload is removed;
- (g) never spray above the vapor level;
- (h) repair solvent leaks immediately, or shut down the degreaser;
- (i) store waste solvent only in covered containers and not dispose of waste solvent or transfer it to another party, such that greater than twenty percent (20%) of the waste solvent (by weight) can evaporate into the atmosphere;
- (j) not use workplace fans near the degreaser opening;
- (k) not allow visually detectable water in the solvent exiting the water separator; and
- (l) provide a permanent, conspicuous label summarizing the operating requirements.

4. Process Operations [326 IAC 6-3]

Pursuant to 326 IAC 6-3 (Process Operations), the allowable PM emission rate from the Process Etch Tanks shall not exceed 0.551 pounds per hour when operating at a process weight rate of less than 0.05 ton per hour.

This registration is a revised registration which includes the construction of new emission units. The source may operate according to 326 IAC 2-5.5.

An authorized individual shall provide an annual notice to the Office of Air Quality that the source is in operation and in compliance with this registration pursuant to 326 IAC 2-5.5-4(a)(3)). The annual notice shall be submitted to:

**Compliance Data Section  
Office of Air Quality  
100 North Senate Avenue  
P.O. Box 6015  
Indianapolis, IN 46206-6015**

no later than March 1 of each year, with the annual notice being submitted in the format attached.

An application or notification shall be submitted in accordance with 326 IAC 2 to the Office of Air Quality (OAQ) if the source proposes to construct new emission units, modify existing emission units, or otherwise modify the source.

Sincerely,

Paul Dubenetzky, Chief  
Permits Branch  
Office of Air Quality

APD

cc: File -Howard County  
Howard County Health Department  
Air Compliance - Marc Goldman  
Permit Tracking - Janet Mobley  
Technical Support and Modeling - Michele Boner  
Compliance Data Section - Karen Nowak

<b>Registration Annual Notification</b>
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This form should be used to comply with the notification requirements under 326 IAC 2-5.5-4(a)(3).

<b>Company Name:</b>	<b>Dupont Photomasks, Inc.</b>
<b>Address:</b>	<b>1901 East Morgan Street</b>
<b>City:</b>	<b>Kokomo</b>
<b>Authorized individual:</b>	<b>Larry McKinley, Manager</b>
<b>Phone #:</b>	<b>(765) 854-7519</b>
<b>Registration #:</b>	<b>067-14962-00066</b>

I hereby certify that Dupont Photomasks, Inc. is still in operation and is in compliance with the requirements of **Registration 067-14962-00066**.

<b>Name (typed):</b>
<b>Title:</b>
<b>Signature:</b>
<b>Date:</b>

## **Indiana Department of Environmental Management Office of Air Quality**

### **Technical Support Document (TSD) for a Registration**

#### **Source Background and Description**

Source Name: Dupont Photomasks, Inc.  
Source Location: 1901 East Morgan Street, Kokomo, Indiana 46904  
County: Howard  
SIC Code: 2796  
Registration No.: 067-14962-00066  
Permit Reviewer: Aida De Guzman

The Office of Air Quality (OAQ) has reviewed an application from Dupont Photomasks, Inc. relating to the construction and operation of the following emission units used in the manufacture of photomasks (templates for electronic circuit boards).

- (a) One (1) proposed diesel-fueled emergency generator, rated at 300 kilowatts (kW) (400 horsepower (HP));
- (b) One (1) proposed CORE Process B, which will utilize non-VOC/HAP material;
- (c) One (1) existing natural gas-fired boiler, with a heat input capacity of 4.5 million British thermal units per hour (mmBtu/hr);
- (d) One (1) existing natural gas-fired boiler, with a heat input capacity of 3.5 mmBtu/hr;
- (e) Four (4) existing natural gas-fired space heaters each with a heat input capacity of 0.102 mmBtu/hr;
- (f) One (1) existing Standard Photomasks Process Line A, which consists of the following:
  - (1) Two (2) Ebeam Write processes, where microfine etches are printed on the photomasks, with a total maximum rated capacity of 7.3 masks per hour;
  - (2) Two (2) Develop/Rinse Tanks, each has a capacity of 2 cubic feet (ft<sup>3</sup>). The two (2) tanks have a total maximum usage of 1.19 pound of solvent per hour (mixture of Methyl Isoamyl Ketone and hexanone, used as developer and rinse);
  - (3) Two (2) Process Etch Tanks, which are capable of using a maximum of 0.8 gallon of caustic soda and acids per hour each; and
  - (4) Three (3) Open Top Vapor Degreasers, identified as VD-1, VD-2 and VD-3, each is capable of using 2.43 gallon of isopropyl alcohol per day.

## Existing Approvals

The source has been operating under Registration 067-10178-00066, issued on November 6, 1998.

## Recommendation

The staff recommends to the Commissioner that the construction and operation be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

A complete application for the purposes of this review was received on October 22, 2001.

## Emission Calculations

- (a) New Diesel-Fired Emergency Generator: See Page 1 of 3 TSD Appendix A for detailed emission calculations.
- (b) Four (4) Natural Gas-Fired Space Heaters: See Page 2 of 3 TSD Appendix A for detailed emission calculations.
- (c) Two (2) Boilers V2 and V3: See Page 3 of 3 TSD Appendix A for detailed emission calculations.
- (d) New CORE Process Line B: There are no VOC nor HAP emitted from this line because non-VOC/HAP material will be utilized;
- (e) Photomasks Process Line A:
  - (1) Ebeam Write Process: There are no emissions from this process, since no VOC/HAP material is utilized.
  - (2) Two (2) Develop/Rinse Tanks:  
Using Methyl Amyl Ketone, DP-20 E-Beam Positive Resist Developer or DP-12 as the solvent at 1.19 pounds/hour.  

VOC Emissions	=	1.19 lbs/hr * 100% VOC* 8760 hrs/yr
		* ton/2000 lb
	=	5.2 ton/yr
  - (3) 2 Process Etch Tanks:  
HCl Emissions  

	=	0.8 gal/hr * 1.20 lb/gal * 3% wt % * 8760 hr/yr *
		ton/2000 lb
	=	0.13 ton/yr * 2 tanks
	=	0.26 tons/yr
  - (4) Three (3) Open Top Vapor Degreasers:  
VOC Emissions  

	=	2.43 gal/day * 7.32 lb/gal * 100% * 365 days/yr *
		ton/2000 lb
	=	3.2 tons/yr * 3 degreasers
	=	9.7 tons/yr

Summary of Emissions (ton/year)						
Pollutant	Space Heaters and Boilers	Emergency Generator	Degreasers	Develop/Rinse Tanks	Process Etch Tanks	Total Potential Emissions
PM	0.0	0.22	0.0	0.0	0.26	0.48
PM10	0.2	0.22	0.0	0.0	0.26	0.68
VOC	0.2	0.25	9.7	5.2	0.0	15.35
CO	3.2	0.67	0.0	0.0	0.0	3.87
NOx	3.7	3.09	0.0	0.0	0.0	6.79
SO2	0.0	0.20	0.0	0.0	0.0	0.20
Single HAP	0.0	0.0	0.0	0.0	0.26	0.26
Combined HAPs	0.0	0.0	0.0	0.0	0.26	0.26

### Potential To Emit

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source or emissions unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA, the department, or the appropriate local air pollution control agency.”

Pollutant	Potential To Emit (tons/year)
PM	0.48
PM-10	0.68
SO <sub>2</sub>	0.20
VOC	15.35
CO	3.87
NO <sub>x</sub>	6.79

  

HAP's	Potential To Emit (tons/year)
Hydrochloric Acid (HCl)	0.26
TOTAL	0.26

### Justification of Approval Level

The source is subject to 326 IAC 2-5.5, Registration, since its volatile organic compounds (VOC) potential to emit are greater than 10 tons per year, but less than 25 tons per year.

### Actual Emissions

No previous emission data has been received from the source.

### Limited Potential to Emit

The table below summarizes the total potential to emit, reflecting all limits, of the significant emission units.

	Limited Potential to Emit (tons/year)						
Process/facility	PM	PM-10	SO <sub>2</sub>	VOC	CO	NO <sub>x</sub>	HAPs
Emergency Generator	0.22	0.22	0.20	0.25	0.67	3.09	0.0
Boilers	0.0	0.2	0.0	0.20	3.0	3.5	0.0
Space Heaters	0.0	0.0	0.0	0.0	0.2	0.2	0.0
Degreasers	0.0	0.0	0.0	9.7	0.0	0.0	0.0
Develop/Rinse Tanks	0.0	0.0	0.0	5.2	0.0	0.0	0.0
Process Etch Tanks	0.26	0.26	0.0	0.0	0.0	0.0	0.26
Total Emissions	0.48	0.68	0.20	15.35	3.87	6.79	0.26

### County Attainment Status

The source is located in Howard County.

Pollutant	Status
PM-10	attainment
SO <sub>2</sub>	attainment
NO <sub>2</sub>	attainment
Ozone	attainment
CO	attainment
Lead	not determined

- (a) Volatile organic compounds (VOC) and oxides of nitrogen (NO<sub>x</sub>) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Howard County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NO<sub>x</sub> emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (b) Howard County has been classified as attainment or unclassifiable for all the other criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

### Source Status

Existing source PSD, Part 70 or FESOP Definition (emissions after controls, based on 8,760 hours of operation per year at rated capacity):

Pollutant	Emissions (ton/yr)
PM	0.48
PM10	0.68
SO <sub>2</sub>	0.20
VOC	15.35
CO	3.87
NO <sub>x</sub>	6.79

- (a) The source is not an existing major stationary source, since there are no attainment



pollutant emitted at a rate of 250 tons per year and it is not one of the 28 listed sources.  
This existing source is being re-registered.

## Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This existing source is not subject to the Part 70 Permit requirements because the potential to emit (PTE) of:

- (a) each criteria pollutant is less than 100 tons per year,
- (b) a single hazardous air pollutant (HAP) is less than 10 tons per year, and
- (c) any combination of HAPs is less than 25 tons/year.

This is a re-registration which includes the construction of new emission units.

## Federal Rule Applicability

- (a) New Source Performance Standards:
  - (1) 40 CFR Part 60.40c, Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units for which construction, modification or reconstruction is commenced after June 9, 1989, and has a maximum design heat input capacity of 100 million British thermal units per hour (mmBtu/hr) or less but greater than or equal to 10 mmBtu/hr.  
  
Boilers V2 and V3 are not subject to this NSPS because each capacity is less than 10 mmBtu/hr.
  - (2) There are no other New Source Performance Standards (326 IAC 12 and 40 CFR Part 60) applicable to this facility.
- (b) National Emission Standards for hazardous Air Pollutants (NESHAPs):
  - (1) 40 CFR § 63.460, Subpart T - National Emission Standards for Halogenated Solvent Cleaning. This subpart applies to each individual batch vapor, in-line vapor, in-line cold and batch cold solvent cleaning machine that uses any solvent containing methylene chloride; perchloroethylene; trichloroethylene; 1,1,1-trichloroethane, carbon tetrachloride, or chloroform or any combination of these halogenated HAP solvents.  
  
This NESHAP does not apply to the three (3) Open Top Vapor Degreasers, identified as VD-1, VD-2 and VD-3, because they do not use any halogenated solvent mentioned nor combination of these halogenated solvents.

## State Rule Applicability - Entire Source

- (a) 326 IAC 2-6 (Emission Reporting)  
326 IAC 2-6 (Emission Reporting), is not applicable to this source because it is not located in any of the counties listed in the rule that emits more than 10 tons/yr of VOC, nor does it emit 100 tons/yr of any pollutant.
- (b) 326 IAC 5-1 (Visible Emissions Limitations)  
Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Exemptions), opacity shall meet the following, unless otherwise stated in this permit:
  - (1) Opacity shall not exceed an average of forty percent (40%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
  - (2) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of

fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

- (c) 326 IAC 6-2-3(a) (Particulate Emissions Limitations for Sources of Indirect Heating)  
 (1) This rule mandates a PM emissions limit for the two (2) boilers, V2 and V3 that were constructed before September 21, 1983, using the following equation:

$$\begin{aligned} Pt &= \frac{C * a * h}{76.5 * Q^{0.75} * N^{0.25}} \\ &= \frac{50 * 0.67 * 26.8}{76.5 * (8)^{0.75} * (2)^{0.25}} \\ &= 2.07 \text{ lb/mmBtu} \end{aligned}$$

Where:

C = Maximum ground level concentration with respect to distance from the point source at the "critical wind speed for level terrain. This shall equal to 50 µg.

Pt = Pounds of particulate matter emitted per million Btu per heat input (lb/mmBtu).

Q = Total source maximum operating capacity rating in mmBtu/hr heat input.  
 = 8.0 mmBtu/hr

N = Number of stacks in fuel burning operation.  
 = 2

a = Plume rise factor which is used to make allowance for less than theoretical plume rise. The value 0.67 shall be used for Q less than 1,000 mmBtu/hr.

pa = the actual controlled emission rate in lb/mmBtu using the emission factor or stack test data.  
 = 5 lb/MMCF \* 70.1 MMCF/yr \* yr/8760 hr \* hr/8 mmBtu  
 = 0.005 lb/mmBtu

h = Stack height in feet. If a number of stacks of different heights exist, the average stack height to represent "N" stacks shall be calculated by weighing each stack height with its particulate matter emission rate as follows:

$$\begin{aligned} h &= \frac{E (H * pa * Q) \text{ from 1 to N}}{E (pa * Q) \text{ from 1 to N}} \\ &= \frac{(27.8 * 0.005 * 4.5) + (25.3 * 0.005 * 3.5)}{(0.005 * 4.5) + (0.005 * 0.005)} \\ &= 26.8 \text{ feet} \end{aligned}$$

Pursuant to section (e) of this rule, for Q of 250 mmBtu/hr or less, which began operation after June 8, 1972, the PM emissions limit shall in no case exceed 0.6 lb/mmBtu. The 0.6 lb/mmBtu limit is equivalent to 21 tons/yr.

The two boilers are in compliance with this rule, because their potential PM emissions are less than the PM limit.

- (2) The four (4) natural gas fired space heaters are not subject to 326 IAC 6-2-4, because they are not sources of indirect heating.

- (d) 326 IAC 8-3 (Organic Solvent Degreasing Operations)  
Sections 2 through 4 of this rule is applicable to new facilities after January 1, 1980, performing organic solvent degreasing operations located anywhere in the state.
- (1) 326 IAC 8-3-2 (Cold Cleaner Operation)  
Sec. 2 is not applicable to the three (3) Open Top Vapor Degreasers, identified as VD-1, VD-2 and VD-3 because the solvent temperature as used is at 180°F which is at the boiling point of the solvent (isopropyl alcohol) used for cleaning. Therefore, the degreasers are not cold cleaner degreasers.
- (2) 326 IAC 8-3-3 (Open Top Vapor Degreaser Operation)  
Sec. 3. is applicable to the three (3) Open Top Vapor Degreasers, identified as VD-1, VD-2 and VD-3, which were constructed in 1983. The owner or operator of the open top vapor degreasers shall:
- (a) equip the vapor degreaser with a cover that can be opened and closed easily without disturbing the vapor zone;
  - (b) keep the cover closed at all times except when processing work loads through the degreaser;
  - (c) minimize solvent carryout by:
    - (A) racking parts to allow complete drainage;
    - (B) moving parts in and out of the degreaser at less than 3.3 meters per minute (eleven (11) feet per minute);
    - (C) degreasing the workload in the vapor zone at least thirty (30) seconds or until condensation ceases;
    - (D) tipping out any pools of solvent on the cleaned parts before removal; and
    - (E) allowing parts to dry within the degreaser for at least fifteen (15) seconds or until visually dry;
  - (d) not degrease porous or absorbent materials, such as cloth, leather, wood or rope;
  - (e) not occupy more than half of the degreaser's open top area with the workload;
  - (f) not load the degreaser such that the vapor level drops more than fifty percent (50%) of the vapor depth when the workload is removed;
  - (g) never spray above the vapor level;
  - (h) repair solvent leaks immediately, or shut down the degreaser;
  - (i) store waste solvent only in covered containers and not dispose of waste solvent or transfer it to another party, such that greater than twenty percent (20%) of the waste solvent (by weight) can evaporate into the atmosphere;
  - (j) not use workplace fans near the degreaser opening;
  - (k) not allow visually detectable water in the solvent exiting the water separator; and
  - (l) provide a permanent, conspicuous label summarizing the operating requirements.
- (3) 326 IAC 8-3-4 (Conveyorized degreaser operation)  
Sec. 4. is not applicable to the three (3) Open Top Vapor Degreasers, identified as VD-1, VD-2 and VD-3 because they are not conveyorized degreasers.
- (4) 326 IAC 8-3-6 (Open Top Vapor Degreaser Operation and Control Requirements)  
This rule applies to open top degreasers with an air to solvent interface of one (1) square meter (ten and eight-tenths (10.8) square feet) or greater. This rule is not applicable to the three (3) Open Top Vapor Degreasers, identified as VD-1, VD-2 and VD-3 because each has an interface area of 1.2 square feet, which is

less than 10.8 square feet.

- (e) 326 IAC 8-1-6 (General Reduction Requirements)  
The source is not subject to this rule, because its potential VOC emissions are less than the rule applicability emissions level of 25 tons per year.
- (f) 326 IAC 8-6-1 (Organic Solvent Emissions Limitations)  
The source is not subject to this rule, because its potential VOC emissions are less than the rule applicability emissions level of 100 ton per year.
- (g) 326 IAC 8 (Volatile Organic Sources)  
There are no other rules in 326 IAC 8 that apply to these facilities, because they do not fit any process categories in the rules.
- (h) 326 IAC 2-4.1-1 (New Sources Toxics Control Rule)  
This rule is not applicable to the source, because it is not a major source for HAPs and its construction predates the applicability date of this rule.
- (i) 326 IAC 6-3 (Process PM Limitation)  
The Process Etch is subject to this rule, which mandates a PM emissions using the following equation:

Interpolation and extrapolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 4.10 P^{0.67}$$

where E = rate of emission in pounds per hour and  
P = process weight rate in tons per hour  
= (0.8 gal HCL/hr \* 1.2 lb/gal) + (7.3 masks/hr \* 0.9 lb/mask)  
=  $\frac{(0.96 \text{ lb/hr} + 6.57 \text{ lb/hr})}{2000 \text{ lb/ton}}$   
= 0.0038 ton/hr, since the process weight rate is less than 0.05 ton/hr, the PM allowable emissions shall be 0.551 lb/hr.

The Process Etch is in compliance with this rule, since its PM emission is less than what is allowed by 326 IAC 6-3-2.

## Conclusion

The operation of the photomasks production plant and the construction of the new equipment shall be subject to the conditions of the attached **Registration 067-14962-00066**.

**Appendix A: Emission Calculations**  
**Internal Combustion Engines - Diesel Fuel**  
**Turbine (>250 and <600 HP)**  
**Reciprocating**

Page 1 of 3 TSD Appendix A

**Company Name:** DuPont Photomasks, Inc.  
**Address City IN Zip:** 1901 E. Morgan St., Kokomo, IN46901  
**Registration No.:** 067-14962-00066  
**Reviewer:** Aida De Guzman  
**Date Application Received:** October 22, 2001

**Emissions calculated based on output rating (hp)**

1 @ 300 kW (400 hp) emergency elec. generator

Heat Input Capacity  
Horsepower (hp)

Potential Throughput  
hp-hr/yr

400.0

3504000.0

Emission Factor in lb/hp-hr	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
	0.0022	0.0022	0.0021	0.0310	0.0025	0.0067
Potential Emission @ 8760 hrs/yr (tons/yr)	3.85	3.85	3.59	54.31	4.40	11.70
Potential Emission @ 500 hrs/yr (tons/yr)	0.22	0.22	0.20	3.09	0.25	0.67

**Methodology**

Potential Throughput (hp-hr/yr) = hp \* 8760 hr/yr

Use a conversion factor of 7,000 Btu per hp-hr to convert from horsepower to Btu/hr, unless the source gives you a source-specific brake-specific fuel consumption. (AP-42, Footnote a, Table 3.3-1)

Emission Factors are from AP42 (Supplement B 10/96), Table 3.3-2

Emission (tons/yr) = [Heat input rate (MMBtu/hr) x Emission Factor (lb/MMBtu)] \* 8760 hr/yr / (2,000 lb/ton )

Emission (tons/yr) = [Potential Throughput (hp-hr/yr) x Emission Factor (lb/hp-hr)] / (2,000 lb/ton )

\*PM emission factors are assumed to be equivalent to PM10 emission factors. No information was given regarding which method was used to determine the factor or the fraction of PM10 which is condensable.

Note: Check the applicable rules and test methods for PM and PM10 when using the above emission factors to confirm that the correct factor is used (i.e., condensable included/not included).

**Appendix A: Emission Calculations**  
**Natural Gas Combustion Only**  
**MM Btu/hr 0.3 - < 100**  
**Commercial Boiler**

**Company Name:** DuPont Photomasks, Inc.  
**Address City IN Zip:** 1901 E. Morgan St. Kokomo, IN 46901  
**Registration No.:** 067-14962  
**Pit ID:** 067-00066  
**Reviewer:** Aida P. De Guzman  
**Date Application Received:** October 22, 2001

4 space heaters @ 0.102 mmBtu/hr

Heat Input Capacity  
MMBtu/hr

Potential Throughput  
MMCF/yr

0.4

3.6

**Pollutant**

Emission Factor in lb/MMCF	PM 1.9	PM10 7.6	SO2 0.6	NOx 100.0	VOC 5.5	CO 84.0
Pot'l. Emissions in tons/yr	0.0	0.0	0.0	0.2	0.0	0.2

**Methodology**

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Emission Factors for NOx: uncontrolled = 100, Low Nox Burner = 17, Flue gas recirculation = 36

Emission Factors for CO: uncontrolled = 21, Low NOx Burner = 27, Flue gas recirculation = ND

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, and 1.4-3, SCC #1-03-006-03

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

**Appendix A: Emissions Calculations****Natural Gas Combustion Only****MM BTU/HR <100****Small Industrial Boiler****Company Name:** DuPont Photomasks, Inc.**Address City IN Zip:** 1901 E. Morgan St., Kokomo, IN 46901**Registration No.:** 067-14962**Plt ID:** 067-00066**Reviewer:** Aida De Guzman**Date Application Received:** October 22, 2001Heat Input Capacity  
MMBtu/hr

4.5	Boiler V2
3.5	Boiler V3

Potential Throughput  
MMCF/yr

39.4
30.7

**Pollutant**

Emission Factor in lb/MMCF	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0	5.5	84.0
				**see below		
PTE in tons/yr (4.5 mmBtu/hr boiler)	0.0	0.1	0.0	2.0	0.1	1.7
PTE in tons/yr (3.5 mmBtu/hr boiler)	0.0	0.1	0.0	1.5	0.1	1.3
TOTAL PTE	0.0	0.2	0.0	3.5	0.2	3.0

\*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined.

\*\*Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

**Methodology**

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (SUPPLEMENT D 3/98)

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

Note: Check the applicable rules and test methods for PM and PM10 when using the above emission factors to confirm that the correct factor is used (i.e., condensable included/not included).